



Peter M. Rooney
Secretary for
Environmental
Protection

Department of Pesticide Regulation

James W. Wells, Director
1020 N Street • Sacramento, California 95814-5624 • www.cdpr.ca.gov



Pete Wilson
Governor

MEMORANDUM

TO: Douglas Y. Okumura, Chief
Environmental Monitoring and
Pest Management Branch

FROM: Pam Wofford, Associate *Wofford*
Environmental Research Scientist
Environmental Monitoring and
Pest Management Branch
(916) 324-4297

Randy Segawa, Senior *Segawa*
Environmental Research Scientist
Environmental Monitoring and
Pest Management Branch
(916) 324-4137

DATE: May 18, 1998

SUBJECT: MONITORING RESULTS FROM A NONTARPED SHALLOW
BROADCAST APPLICATION IN MERCED COUNTY - METHOD 1.1

Introduction - Methyl bromide is widely used as a preplant soil fumigant for control of nematodes, fungi, diseases and weeds. The Department of Pesticide Regulation (DPR) and county agricultural commissioners have implemented permit conditions, including buffer zones, to mitigate unacceptable methyl bromide exposure. Buffer zone distances are set so that concentrations measured at this distance do not exceed 0.21 parts per million (ppm; 24-hour time-weighted average). The buffer zone distances for the methods have been determined from data received and evaluated by DPR to date. Additional monitoring was conducted to test and evaluate the effectiveness of the buffer zone distances.

Materials and Methods - The eighth field monitored was a 7.5-acre field near Livingston (Merced County) treated with methyl bromide by a shallow nontarped application method (method 1.1) on March 12, 1998. In this method the methyl bromide is injected into the soil at a depth of 18 inches. At this application, the application rig was followed by a tractor with a disc and ring roller to finish the soil surface. The field was the last section of a 30-acre field being treated with methyl bromide for planting to sweet potatoes. An approximately 1-acre piece of

the field and most of the area adjacent to the southeast edge of the application area had been treated three days previously. The application rate was 150 pounds per acre of formulated product, 99.5 percent methyl bromide/0.5 percent chloropicrin. The application took approximately 3.5 hours.

Ambient air samples were collected at fourteen locations using charcoal tubes and SKC air samplers. Four samplers were located at the residential buffer zone distance, two on the northwestern side and two on the southeastern side. Fenced properties on the southwestern side and a freeway on-ramp on the northeastern side prevented placement of samplers at the buffer zone distance on those two sides. Two 14-hour background air samples were taken the night before application to determine air concentrations present from previous treatment. Ten samplers were located 30 to 90 feet from the edge of the field, one on each side and each corner plus an additional sampler on the eastern and western sides. Based on permit conditions, the buffer zone determined for the application was 200 feet. Table 1 and Figure 1 indicate the position of each sampler. A series of five samples was collected at each of the 14 locations beginning with start of fumigation at 07:00. Samples were collected for two 6-hour and three 12-hour periods, for a total of 48 hours.

The weather was overcast with rain during the day after application. Temperatures ranged from 44 to 66 degrees Fahrenheit. Wind speeds ranged from very calm to 15.4 miles per hour with speeds 7 mile per hour or less for 79 percent of the time during monitoring. The wind blew predominantly to the northwest during the monitoring period

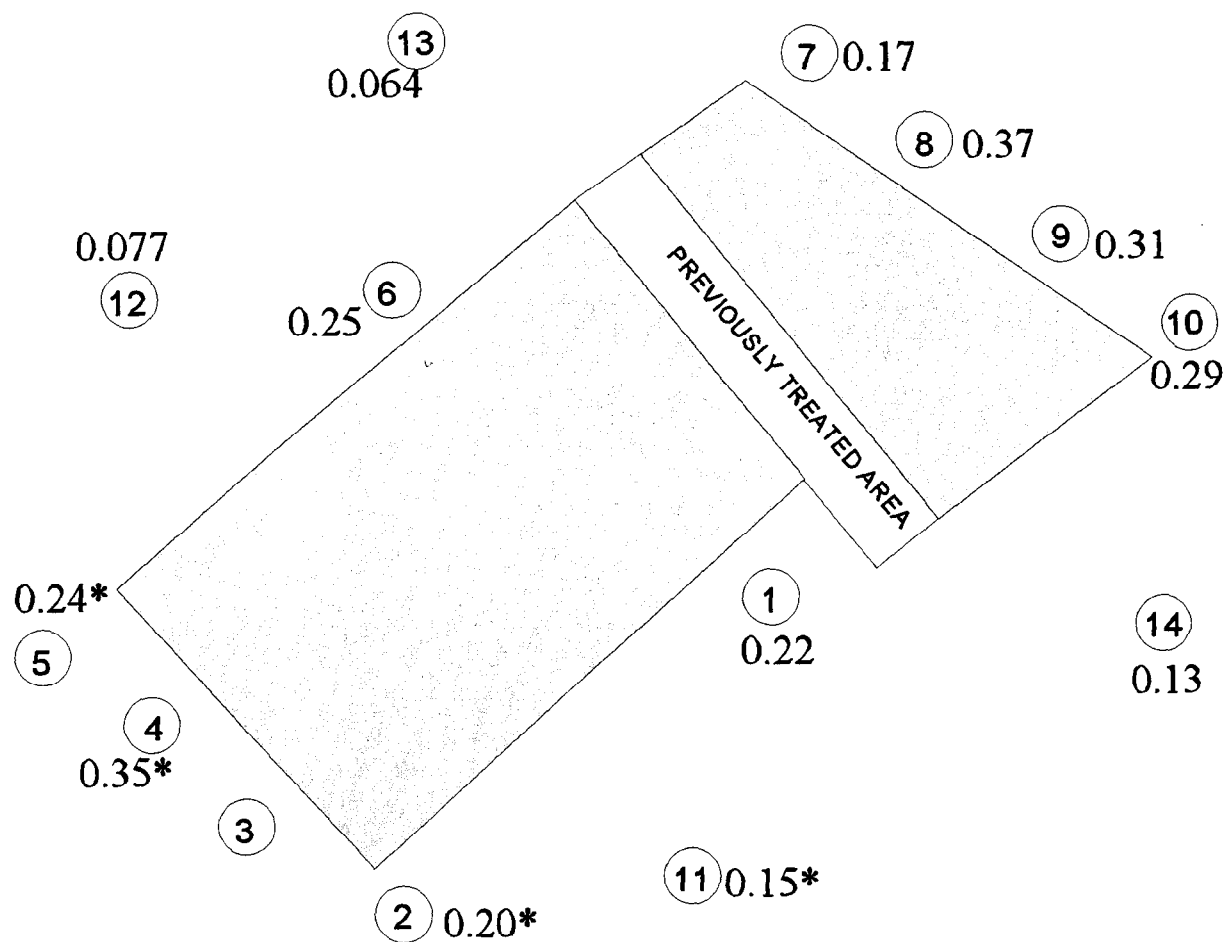
Results - Off-site air concentrations did not exceed DPR's target level of 0.21 parts per million (24-hour time weighted average) at the samplers located at the residential buffer zone distance of 200 feet (Table 1). However, because of limitations to sampler placement, there were no samplers located at the buffer zone distance in the downwind direction. The two background concentrations were 0.12 and 0.10 parts per million. Air concentrations ranged from 0.064 to

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0.15 parts per million (24-hour time weighted average) at the 200 foot buffer zone distance. The highest concentrations were detected during the first 12-hour monitoring interval.

Figure 1. The application site, sampling sites and highest 24-hour time weighted averages (parts per million).

(* indicates that 24-hour average includes a period of no detectable amount where $\frac{1}{2}$ the detection limit was used to obtain the 24-hour average).



Sites 1-10 are located approx. 30-90 feet from field

Sites 11-14 are located approx. 200 feet from field

Table 1. Ambient methyl bromide air concentrations.

Sampler Location			Methyl Bromide (ppm) for Each Sampling Period					24-hr Peak ¹
			07:00 - 13:00	13:00 - 19:00	19:00 - 07:00	07:00 - 19:00	19:00 - 07:00	
Site ID	Direction	Distance (ft)	(6 hrs)	(6 hrs)	(12 hrs)	(12 hrs)	(12 hrs)	(24 hrs)
1	south	50	0.023	0.201	0.326	0.054	0.143	0.219
2	southwest	40	ND^a	0.101	0.353	0.042	0.188	0.203*
3	west	55	sample	0.160	0.514	0.013	0.220	sample broken
4	west	55	ND	0.162	0.624	ND^b	0.248	0.354*
5	west	90	ND	0.113	0.420	ND	0.079	0.240*
6	north	30	0.097	0.130	0.380	0.008	0.200	0.247
7	northeast	53	0.090	0.226	0.190	ND	0.085	0.174
8	east	36	0.096	0.366	0.505	0.007	0.139	0.368
9	east	38	0.069	0.294	0.441	0.009	0.080	0.311
10	east	37	0.043	0.118	0.495	0.008	0.078	0.288
11	south	220	ND	0.085	0.261	0.033	0.116	0.153*
12	north	200	0.026	0.015	0.133	ND	0.060	0.077
13	north	215	0.036	0.022	0.098	ND	0.061	0.064
14	south	215	0.028	0.071	0.218	0.022	0.080	0.134

¹ the peak 24-hour time-weighted average is derived from the concentrations in bold.

* indicates that 24-hour average includes a period of no detectable amount where ½ the detection limit was used to obtain the 24-hour average.

ND = No detectable amount; ^a reporting limit = 0.010 ppm, ^b reporting limit = 0.005 ppm